how to profit

from facts

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introduction

As the owner-operator of a business you wear many hats. You are your own expert in the areas of finance, production, marketing, and purchasing to name a few. Each day you are required to make decisions which affect the day to day operation of your business. Frequently you are required to make decisions which affect the future operation of your business. As you know, some of these decisions can determine your success or failure.

How do you go about reaching a good decision? Usually, the more you gather useful information, the greater are your chances of reaching the best one. The sources of this information take many forms. Some of them are your experience, your knowledge of the business, the advice and suggestions of associates, accountants, suppliers, and lawyers. These are the tools you can use to build a decision. Another tool you can use is facts which take the form of statistics.

Plans, too, are important. To operate successfully you need planning based on reliable information. Planning is your most effective method for obtaining the best possible results in whatever set of existing conditions.

The Dominion Bureau of Statistics is organized to help you with these two aspects of your business by providing information. It is a service agency for industry, labour, and government alike. All of its functions were established as the result of the public need for information. Under the Statistics Act of 1918 the function of DBS is defined as —

"... to collect, abstract, compile and publish statistical information relative to the commercial, industrial, social, economic and general activities of the people."

Just what is "statistical information"? Let's suppose you are the manager of the Jones Co. You have just been provided with the following information:

1. your average cost of processing an invoice is $4.20

2. of your 66 employees, 2/3 have been with you less than 5 years

3. 20% of your customers account for 75% of your business

4. your cost of materials, fuel, and electricity represents 43% of the selling value of your shipments.

These are statistics. They involve the collection of facts. The information is analysed, interpreted, and then presented in some useful compact form. We can name this kind of information "internal" statistics because it is arrived at from within your firm. You don't need any outside data to get these statistics.

But you do need outside data if you want to compare your operations with those of your competitors, or if you want to analyse your market, or predict your sales. This type of information is often in the form of statistics too. It is made possible when the information you submit to DBS is compiled. We can call it "external" statistics. That's what DBS supplies.

The information is collected in two basic ways. One is from the entire population, as in the 1961 Census, or from the entire group of retail establishments, as in the census of retail trade.

The second method is by collecting information from a sample of the whole group. The sample of, say, the labour force, is constructed in such a way that the results are typical of the whole group. And the estimates based on these samples are surprisingly accurate. This method allows for faster and cheaper collection and publication.

Information is available on a score of things a businessman would want to know about. Things like the value of retail sales by commodities; numbers and kinds of retail and service establishments; sales and size distributions; and inventory levels. Then there is a voluminous amount of data just on people; things like their ages, sex, native languages, income, location, etc.

For the manufacturer there is information like the number and sizes of plants in different industries; value of factory shipments; number of employees; costs of materials, fuel and power; and much more.

In this booklet we have used case studies to illustrate the use of statistics. Although some of the details are fictitious the cases are all typical of what is done with DBS information. If your particular industry or interest area is not discussed it certainly does not mean the information isn't available — it probably is.

Finally, we should point out that firms which already employ trained professionals in the use of statistics will likely find this booklet a little elementary for them. It is primarily intended for persons or firms which make little or no use of statistical information now.

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you and
your markets

You don't have to be a large firm to make use of external statistics. After all, the problems of the small business differ more in degree than in kind from those of their large competitors. Neither the largest supermarket nor the smallest grocery store has unlimited shelf-space or capital. And neither can afford to tie up their assets in the wrong goods.

THE MARKET

There are two types of markets. Economically speaking, you and your family are consumers. You buy shelter, food, clothing and so on. Goods and services bought by people for their personal use are in the consumer market. This is the basic market because all goods and services produced eventually lead to a consumer product or service. On the other hand, your company buys materials, tools and labour. Your company is thus part of the market for these products. This is defined as the industrial market. It embraces all markets other than consumer, and includes such things as:

— **raw materials bought by processors or manufacturers**

— **manufactured goods bought by other manufacturers for use or resale**

— **goods and services bought by retailers, wholesalers, governments and institutions.**

DBS provides a good deal of information on both consumer and industrial markets.

case study I   "where should you locate a service business"

Joe Keene had worked for a professional portrait photographer in Toronto for several years. He was a good photographer. He had saved enough money to buy equipment and now wanted to start a business of his own. He was especially good at portraits of young children and the teen-age group.

Joe and his wife didn't want to live in a big city and decided to locate in either Niagara Falls or Welland, whichever offered the better opportunity. To start his investigation Joe obtained some 1961 Census data from DBS. He was able to extract the following facts.

In Welland there were 3 portrait photographers who shared a total income of $42,300 in 1961 . . . an average of $14,100. Among them they had 3 employees who were paid $6,700 in wages.

There were also 3 portrait photographers in Niagara Falls. Their combined income was $26,100 . . . an average of $8,700, much lower than in Welland. The Niagara Falls group didn't have any paid employees in 1961.

Now he was curious about the size of his potential market in the two cities. He found the following on the population:

	Total	Age - group			
		0 - 4	5 - 9	10 - 14	15 - 19
Welland:					
Totals	36,079	4,161	4,131	3,714	2,811
Male	18,184	2,110	2,086	1,901	1,419
Female	17,895	2,051	2,045	1,813	1,392
Niagara Falls:					
Totals	22,351	2,028	1,906	1,967	1,634
Male	10,774	1,005	938	940	795
Female	11,577	1,023	968	1,027	839

Note: Partial table.

Joe could have obtained the population by five-year age groups and sex right up to 95 or more years of age, but he was primarily interested in the young people.

In another census publication he found there were 5,633 families in Niagara Falls and 8,873 families in Welland. These accumulated statistics showed some close similarities between the cities. For instance, the combined income of the photographers in Niagara Falls was $26,100, or about $4.60 per year, per city family. In Welland the average was about $4.75. The population of Niagara Falls was about 62% of the Welland population and the Niagara Falls photographers' income was about 62% of the Welland group's income.

Now Joe wanted an idea of the average incomes for the two cities. Using labour census data he found this:

City	Total wage-earners		Average earnings	
	Male	Female	Male	Female
			dollars	
Welland.........................	8,612	3,022	3,925	1,932
Niagara Falls	5,477	2,765	3,581	1,914

City	Wage-earners reporting earnings by amount of earnings (partial breakdown)					
	$3,000 - 3,999		$4,000 - 5,999		$6,000 +	
	Male	Female	Male	Female	Male	Female
Welland.........................	1,612	428	3,435	166	1,054	41
Niagara Falls	958	392	1,911	169	511	47

Joe Keene felt his future would be more secure if he were to locate where incomes were relatively high. He reasoned that since his services were certainly not a necessity for the average family there may be a relationship between higher incomes and the amount spent on portraits. He noticed the average male earnings were about 10% higher in Welland. He also noted there were twice as many people who earned $6000 or more in Welland than in Niagara Falls.

Now Joe was puzzled. If there **was** a relationship between earnings and how much one spent on portraits, why wasn't the income of the Welland photographers on a per city family basis, significantly higher than the Niagara Falls group? There was only a difference of fifteen cents. Could it be because the Welland market was not as well developed as the Niagara Falls market?

Joe realized the census data were not current but they provided him with some interesting facts. It had been a good way to begin his study. Now he planned to visit the two cities and try to get more information from the chambers of commerce, boards of trade, and by local investigation. He also thought he would see if there was a trade association of portrait photographers that could help him. In addition, he felt he should write to DBS to see if there was any current information available but not yet published. Finally, he thought he should gather the same data for two or three other cities. There might be a better opportunity elsewhere.

We don't know where Joé Keene finally opened his business. But we used this case to illustrate two things. The first is how census data can be useful. Second, and perhaps more important, is the fact that statistics don't provide all the answers. They have to be combined with common sense, experience, other sources of information, and good judgement. They are just another tool you can use to help you reach a decision.

case study II   "a producer and his wholesaler select retail outlets"

The K Company had been a manufacturer of ladies apparel for a long time. Two years ago they completed an expansion of facilities. Although the demand for the company's products was slowly rising, there was still idle capacity because of the new facilities. Following a reappraisal of the versatility of their machinery and their supply of materials and existing manpower, they decided they could produce and sell children's and infants' wear. The K Company had studied population statistics also. They had an idea of the **number** and location of young families and of the age distribution by sex. They knew that the Canadian population was growing at about a rate of 2% per year. Naturally the company was most interested in the existing sales of children's and infants' wear. From a DBS publication they found this:

RETAIL SALES, 1961 CHILDREN'S AND INFANTS' WEAR

	$
Newfoundland	3,867,600
Prince Edward Island	719,200
Nova Scotia	6,346,600
New Brunswick	4,421,500
Quebec	48,906,700
Ontario	61,590,700
Manitoba	7,159,300
Saskatchewan	8,041,900
Alberta	12,899,500
British Columbia	13,763,200
Total for Canada, 1961	168,086,600

Now they were more interested than ever. They knew the business must have grown since 1961 and that the demand would continue to grow as the population and disposable income increased. The K Company had done a private survey to find out the competitive price structure at the retail and wholesale levels for the new line. But they did not have precise knowledge on **where** the consumer was buying children's and infants' wear. What type of store or stores should they use to sell their new line? The K Company used wholesalers for their regular line of ladies' wear and thus their sales force was not a large one. It was therefore decided to use another wholesaler for the new line. The new wholesaler was well organized and knowledgeable on the distribution of children's and infants' wear. The K Company was surprised when the wholesaler presented the following facts:

DISTRIBUTION OF RETAIL SALES OF CHILDREN'S AND INFANTS' WEAR, CANADA, 1961

	$
Department stores	46,923,300
Children's and infants' wear stores	39,864,100
Variety stores	36,143,600
Family clothing and furnishing stores	24,967,500
Women's ready-to-wear stores	7,837,200
General merchandise stores	6,065,700
General stores	5,623,500
All other	661,700

The wholesaler also had data on the number of each kind of store, how many were located in each province, each city, and miscellaneous information on the number of employees, annual sales, inventory levels and payrolls. The K Company and the wholesaler now began to plan a promotion and advertising program. They were in a good position to direct the campaign to where it would be most effective — to the consumer because they knew where she was located — and to the kind of retail store that offered the most potential.

All of the above information had come from DBS. Practically free. In addition, the wholesaler had studied copies of monthly reports from DBS on retail trade. Information was also obtained from monthly bulletins on "Chain Store Sales and Stocks" and "Department Store Sales and Stocks". These reports, being current, confirmed the impression that retail sales were increasing substantially and at a good rate. In addition to dollar retail sales they were able to get data such as this:

Percentage Changes in Retail Trade — by Provinces and Kinds of Business

January to April 1965 over January to April 1964
(partial list)

Kind of business	Canada	Atlantic Provinces	Que.	Ont.
General stores	+ 3.0	+ 3.3	+ 8.2	− 2.3
Department stores	+ 4.4	+ 4.8	+ 4.2	+ 4.7
Variety stores	+ 11.7	+ 29.9	+ 5.0	+ 8.8
Family clothing	+ 6.7	+ 6.8	+ 6.2	+ 4.6
Women's clothing	+ 4.4	+ 1.4	+ 3.5	+ 4.3
	Man.	Sask.	Alta.	B.C.
General stores	+ 2.0	− 1.0	+ 6.0	+ 7.5
Department stores	+ 4.0	− 1.6	+ 2.2	+ 7.0
Variety stores	− 2.6	+ 8.4	+ 26.2	+ 24.2
Family clothing	+ 3.4	+ 2.4	− 2.8	+ 27.3
Women's clothing	+ 6.6	+ 0.9	+ 6.2	+ 7.0

The K Company did not limit their study to DBS information. DBS was only one of many sources of information. But the data certainly was comprehensive, readily available, inexpensive, and useful.

case study III   "is the market big enough for a new line?"

Tom Acton was president of Model Manufacturing Ltd. The company was a metal fabricator and was versatile in the metal stamping, pressing, and coating fields. They had enjoyed a period of growth both in volume of business and in profits. Tom and his staff were anxious to investigate new possibilities for utilizing their equipment and know-how. Nearly all of their business was on a contract basis with the automotive and aircraft industries, but Tom felt they could manufacture some consumer products. Adequate profits had been retained to keep the plant equipment up to date and, if necessary, capital could be raised to finance the purchase of new equipment and materials.

They considered metal furniture. The plant manager, after an investigation, assured Tom they had most of the equipment and skilled labour to produce metal furniture. Part of Model Manufacturing Ltd.'s study of the proposal involved writing to

DBS. They asked for data on the furniture industry, particularly metal furniture. They were amazed at the volume of material that came back. We couldn't possibly cover all of it here. For a start, they found out how many establishments in the "furniture and fixture industries" there were in Canada, and how many in each province. "Furniture and Fixture Industries" was broken down into four separate industries:

Office furniture industry

Household furniture industry

Miscellaneous furniture industries

Electric lamp and shade industry

They found how many employees there were in each of these groups, what the payroll was, the cost of materials, and the value of all factory shipments. Not only that, but there was a report for each of the four groups that broke down "materials and supplies used" into a number of different items. This report showed the quantity and value used of each item by all the plants that made up that industry. But Tom, we recall, was more interested in **metal** furniture statistics. The above information dealt with all kinds of furniture.

There was no single publication dealing solely with the metal furniture industry. But Tom collected plenty of valuable information out of the three reports dealing with furniture. Each of these had separate sections on metal furniture only and each showed the value of factory shipments for 1962 in different categories. Here's an example from the Office Furniture report.

SHIPMENTS OF GOODS OF OWN MANUFACTURE, 1962

	Value $
Office desks, metal	6,033,000
Office chairs, metal (upholstered or not)	5,409,000
Filing cabinets and other filing units	6,348,000
Other metal office furniture or equipment	2,217,000
Total	**20,007,000**

And here's an example from the Household Furniture report—

SHIPMENTS OF GOODS OF OWN MANUFACTURE, 1962

	Value $
Breakfast-room and kitchen furniture, metal	17,599,000
Children's furniture, metal	193,000
Porch, garden and lawn furniture, metal	5,739,000
Wrought iron furniture	996,000
All other household furniture, metal	3,691,000
Total	**28,218,000**

The company's staff then made a study of population and housing information. From this, they found out how many families there were, how many detached and semi-detached houses, how many houses had 2, 3, or 4 bedrooms, and so on.

To highlight their information on sales figures they were pleased to receive a report called "Products Shipped by Canadian Manufacturers, 1961". In it they found this:

Furniture: **Metal**	Quantity	Value of factory shipments
		$
Beds:		
Bunk	15,375	176,809
Cots	97,592	765,635
Couches (other than studio)	16,775	293,998
Cribs	3,147	87,878
Hospital	17,663	1,005,889
Household	88,653	992,046
Breakfast room and kitchen	—	15,842,393
Camp, lawn and verandah	—	5,295,000
Children's	—	358,000
Hospital (excluding beds)	—	1,620,449
Household (not elsewhere classified)	—	5,828,000
Office desks	37,050	4,135,866
Office, other	—	11,897,323
School, church, lodge, etc.	—	8,798,834
Store furniture and fixtures	—	3,362,000
Other	—	3,990,745

Naturally they did not intend to manufacture all varieties of metal furniture. But now they certainly had an idea of how the metal furniture business was made up. This could help them in selecting their products. For instance, why bother with children's metal furniture right away? The sales are not nearly as big as, say, hospital beds.

In the meantime, Tom's sales manager had found more useful statistics. He had data on the inventory situation for the whole furniture industry. Also for the specified industries (e.g. household, office). The data showed beginning and ending inventories (book values) for raw materials and supplies, goods in process, finished goods, and products or materials purchased for resale.

Tom Acton had mentioned the project to his bank manager, and at his suggestion had asked DBS for import and export data on metal household furniture. He had a report from DBS which showed that in the first 3 months of 1965, Canada had exported $27,644 worth of metal household furniture to ten countries, and the total for the year 1964 was $444,000. The countries were named and the amount each had bought was shown. The import data from DBS was even more revealing. Under a heading "furniture, metal, household, not upholstered" it showed that nearly $2 million worth had been imported in 1964. Sixteen countries of origin were named and the value given for the amount imported from each.

It was now apparent that a detailed study of one or two products was needed. DBS had supplied enough information to convince Acton that the field was big enough to support another manufacturer. Incidentally, the reports also gave distributions of the size of the plants already in the industry. It was done two ways; by the number of employees and by value of shipments.

To accomplish the detailed product study Tom would need experienced market researchers. Like the K Company, he would need to know all he could about the market and distribution for these products. He decided to employ the services of a consulting firm or an advertising agency. As we said before, DBS statistics can't do everything.

In the business world, statistics are put to a great variety of uses. More than 800 business firms were asked recently what they did with statistics. Here are some of the most common replies:

1. **choosing city markets for more intensive cultivation**

2. **fixing quotas of salesmen**

3. **allocation of advertising funds between markets**

4. **deciding whether or not market potentials justify introducing a new item**

5. **dealer promotion — to show them their potential**

6. **deciding on the number of salesmen to be employed**

7. **choice of new specific advertising media**

8. **deciding on new location for sales branches, retail outlets, or factories.**

Good knowledge of your markets is essential to good business. Not long ago a study of the causes of business failure of small manufacturing firms was done by a group at the University of Michigan. It was a three-year study. In the first year, 95 new firms were established. Three years later only 37 were judged to be successful. Here is a quotation from the report:

"Among the outright failures, inability to find a profitable market was the most important single differentiating characteristic. This broad generalization embraces such disparate situations as complete or nearly complete absence of demand for the product and impotence in reaching a known, existing market . . . In any event, the conclusion accords with the opinion of specialists in marketing for small businesses that hundreds can produce a good product for every one who can sell it".[1]

[1] **Management Factors Contributing to the Success or Failure of New Small Manufacturers — 1964** Bureau of Business Research, University of Michigan.

"you and your industry"

In the first section we discussed you and your markets and ways in which statistical information can help you. Now we'll talk about you and your competitors.

DBS has classified all of the economic activity of Canada into nearly 300 separate industries with a code number for each one. An industry is composed of establishments or plants engaged in the same or a similar kind of economic activity. Examples are abrasives manufacturers, shoe factories, machine shops, department stores, laundries. The classification is a comprehensive one, and a manual is available for the businessman who wants to spend some time studying the composition of various industries. For instance, there are 12 divisions of economic activity. Division 5 is "Manufacturing Industries", and is broken down into 20 Major Groups. Major Group 4 is called "Leather Industries", and it is further broken down into the following individual industries on which statistics are published:

1. **leather tanneries**

2. **shoe factories**

3. **leather glove factories**

4. **luggage, handbag and small leather goods manufacturers.**

Thus when we speak of you and your industry, we mean you and all the other establishments that are engaged in making, as their principal activity, the same or similar product, or providing the same or similar service. Information is collected from your plant and all the others in the same industry. This information is then compiled and presented as "industry statistics". This means you can compare your firm's performance with that of the industry. But you must remember that industry statistics are not necessarily commodity statistics. For example, the "value of shipments" from meat processors is not made up of meat products only. It can include chemicals, oils, soap, and any other product the firm may be producing. There are certain reports, however, that show the value of shipments by commodity or product. The industry information is published in such a way that no one firm can be identified.

Some of your decisions require only internal statistics. But a good many require the use of external data too. In addition to studying the data on your industry for comparison purposes, there are two other popular uses made of this kind of information:

1. to study the various industries which contain your customers, or potential customers

2. to study the various industries which contain your suppliers of materials, goods, and services.

In this section we will examine two cases where external statistics are used.

case study IV
"a manufacturer looks
at his industry"

Bill Secord was a pleased man. His company, Veneer-Plywood Ltd., had had a good year. It was not a giant company. Sales were $850,000 and there were 67 employees counting Bill. Sales were up 8% over the previous year and profits, although not up as much as sales, were adequate.

Bill had enough orders and contracts with customers that he felt his sales would continue to grow at a good rate. He might even have to expand his operation in a year or two.

For the moment, however, he was curious to know how the rest of the wood industries were performing. He recently had supplied DBS with a lot of information and felt he should be able to get some of the resulting statistics back. He wrote for a catalogue and was surprised to find several publications listed, all dealing with the wood industries.

Wood industries were classified under Major Group 8 and contained the following separate industries:

Code	Industry
251	sawmills
252	veneer and plywood mills
254	sash and door and planing mills
256	wooden box factories
258	coffin and casket factories
259	miscellaneous wood industries

There were several reports which Bill ordered, and for different reasons. One report was called "Peeler Logs, Veneers and Plywoods". It showed deliveries, consumption and month-end stocks of peeler logs by kinds of wood. Bill wanted to look through this report to study the supply situation for his operation. He also ordered some publications on the furniture industry to find out more about his customers' situation and growth rates.

The publication Bill was most interested in was titled "Veneer and Plywood Mills". This was the report that would show him how his industry was performing. And it was this report which provided all of the information to follow.

Right away he was disappointed. The information he received was for the year 1962. In most cases the 1962 values were compared to 1961 values, but in one case the values were shown from 1957 to 1962. Bill realized, however, the 1962 data would be very useful. He could compare his 1962 operation with the report and he might even forecast what the current situation might be. He felt his trade association would also be able to help him. And DBS could have more recent data on sales and shipments which would be available soon.

The first group of statistics which interested Bill was this:

1962	Estab-lish-ments	Production and related workers		
		Number	Man-hours paid	Wages
	No.		'000	$'000
Quebec	23	2,329	5,536	6,420
Ontario	28	2,341	5,140	7,178
British Columbia	20	5,532	11,103	24,843
Other	8	619	1,188	1,727
Totals	79	10,821	22,965	40,168

	Cost of fuel and elec-tricity	Cost of materials and supplies used	Value of shipments of goods of own manu-facture	Value added
	$'000			
Quebec	490	14,147	28,424	13,789
Ontario	422	15,826	29,588	13,949
British Columbia	1,763	57,529	102,425	43,844
Other	269	3,040	5,606	2,580
Totals	2,945	90,544	166,043	74,161

This report gave Bill a quick picture of the whole veneer-plywood industry. The number of plants, number of employees, payroll, costs of fuel and electricity, and cost of materials and supplies used enabled Bill to work out some ratios. He was able to compare his costs in these areas against the average of the industry as a percentage of sales. For instance, Bill's production labour costs represented about 23.8% of the selling value of his shipments. This was below the industry average of about 24.2%.

Detailed explanatory notes were contained in the report. These notes outlined how the data were arrived at and what was included under each heading. For instance, ''Value Added'' figures were compiled by deducting the cost of materials and fuel and electricity consumed from the value of production.

The next thing of interest was a detailed table of the inventory situation. This table showed, for the 4 geographical areas, beginning and closing inventories, book value, for:

1. **raw materials and supplies**

2. **goods in process**

3. **finished goods of own manufacture**

4. **products or materials purchased for resale.**

Once again Bill was able to compare his situation with that of the other 78 plants. But he realized there were large and small veneer-plywood mills, and that the cost ratios and value-added would differ for each size of plant. Large plants could take advantage of volume buying and often had more opportunity to utilize specialized machinery and labour.

He was pleased to find tables in the report which gave statistics on the industry by size distributions. For example, there was a table based on shipments of goods of own manufacture. Bill's plant fitted into the $500,000 - $999,999 class.

Size group	Estab-lish-ments	Production and related workers		
		Number	Man-hours paid	Wages
	No.		' 000	$' 000
$ 100,000 to $ 199,999	5	113	221	271
200,000 '' 499,999	14	574	1, 255	1, 535
500,000 '' 999,999	10	716	1, 635	2, 028
1,000,000 '' 4,999,999	32	5, 221	11, 482	17, 860
5,000,000 and over	7	4, 127	8, 224	18, 285
	Cost of fuel and elec-tricity	Cost of materials and supplies used	Value of shipments of goods of own manu-facture	Value added
	$' 000			
$ 100,000 to $ 199,999	21	440	691	249
200,000 '' 499,999	217	2, 625	4, 836	2, 040
500,000 '' 999,999	155	4, 438	8, 566	3, 985
1,000,000 '' 4,999,999	1, 281	39, 499	76, 152	36, 205
5,000,000 and over	1, 247	43, 267	75, 245	31, 402

Note: Partial table.

He found there were only 9 other plants in his class, and he now knew that his batting average wasn't bad, because his cost analysis compared reasonably well with that of the estabments more closely scaled to his.

There were 3 other tables based on size distributions that gave the same kind of information:

1. **based on manufacturing value added. (He could calculate the "value added" for his firm using the method explained above and find his class)**

2. **based on total value added (includes the above plus value added by non-manufacturing activities e.g. goods purchased for resale)**

3. **based on total employed. (Bill noted there were 12 other plants which employed between 50 and 99 people. He could compare his internal statistics with this group too).**

Then there were two further breakdowns of primary interest to Veneer-Plywood Ltd. One was a detailed table of "Materials and Supplies Used in Manufacturing Activity". This table showed the quantities and costs of 36 different items used in the veneer-plywood industry. They ranged from such items as types of veneer logs, types of rough and dressed lumber, veneers and plywoods from other establishments, to types of synthetic resins, containers, and maintenance supplies. From this breakdown Bill Secord could get an idea of whether or not his costs for materials were in line with the industry average. For example, he noted the industry consumed 9,535,675 lb. of urea type resin at a cost of $945,000, an average of about 10¢ per pound. Bill's cost was quite a bit more and he decided he would investigate buying in larger quantities at a discount to get the cost down.

The other breakdown was a similar one on "Fuel and Electricity Used in Manufacturing Activity". It showed quantities and costs of different types of fuel consumed.

Finally there was a breakdown of quantities and values of shipments of manufactured goods. This was where Bill could determine what his share of the market was, and by different products. Not only could he calculate his share, but it might indicate to him an opportunity for a new product. Here is a sample of the breakdown:

Shipments of Goods of Own Manufacture, 1962

Plywood (Nominal sanded, 1/4" thickness basis)	M sq.ft.	Value
		$'000
Softwoods:		
Douglas fir	1,651,106	85,671
Hemlock, white pine, etc.	88,557	3,973
Hardwoods:		
Birch, yellow and white	116,449	16,985
Maple, Ash, Elm, etc.	3,833	545
Poplar, Aspen and Cottonwood	166,437	8,475
Basswood, etc.	1,442	218
Mahogany	11,135	2,384
Oak	2,980	783
Walnut	11,402	2,839
Other	8,763	1,791
Totals	**2,062,104**	**123,664**

Note: Partial list.

Bill was surprised to note $2,384,000 worth of mahogany plywood was shipped in 1962. He had once thought of making this product but felt the demand was much lower than it apparently was. He decided to look into it again. We could go on and on about what Bill Secord was able to learn on his industry. But we've done enough to show you that you also could benefit by the study of industry statistics.

Chances are you can get similar data on your industry. All of the publications are listed and described in the DBS catalogue. Although the detailed publications on industry statistics are annual, there are several other useful bulletins which are more frequently released. Many are monthly. For instance, Bill subscribed to a monthly report on the production, shipments, stocks and exports of peeler logs, veneers and plywoods. This report allows him to keep track of some market conditions. He can relate the changes in his monthly sales to the industry sales. For example, if Bill had a slow month, it would be some comfort to know that everyone else's sales were slow too. In other words, he would be reassured that his share of the market had probably stayed the same.

case study V   "a retailer checks his operating results"

Not long ago an independent retail clothing store manager wrote to DBS. He operated a family clothing store in the Atlantic Provinces. Shortly before writing, his accountant had supplied

him with a detailed report of the past year's operation. After studying the profit and loss statement and the balance sheet, he decided to ask DBS if there was anything available he could use to compare with his figures. He received a report titled "Operating Results and Financial Structure Retail Clothing Stores (Independent)". Just what he wanted! The report was broken down into data on 4 types of retail stores:

1. men's clothing stores

2. women's clothing stores

3. family clothing stores

4. family shoe stores.

In the section on family clothing stores there were 7 tables of revealing data. We are not going to discuss them all.

One table gave 5 key balance sheet ratios as at December 31 for each of the past 6 years. They were:

current ratio

liquidity ratio

working capital to net worth ratio

work debt ratio

turnover of total capital employed.

A second table presented profit and loss information, as a percentage of net sales. Here is a section of that table:

	Owned stores with annual net sales of		Rented stores annual net sales of		
	$20,000-49,999	$50,000-99,999	$20,000-49,999	$50,000-99,999	$100,000 and over
	percentage				
Gross profit	25.37	25.63	28.13	25.74	27.82
Operating expenses:					
Employees salaries and wages	4.72	7.90	5.14	7.11	9.52
Delivery	0.38	0.93	0.22	0.39	0.32
Occupancy expenses:					
Taxes	1.45	0.94	0.55	0.56	0.35
Insurance	1.26	0.93	0.93	0.95	0.89
Rent...........................	—	—	4.04	2.81	3.32
Heat, light, power	1.30	0.92	0.93	0.72	0.42
Repairs and maintenance	0.61	0.65	0.43	0.48	0.31
Depreciation allowances	1.25	0.85	0.41	0.67	0.56
Total occupancy expenses	5.87	4.28	7.29	6.19	5.85

Note: All values as percentages of net sales.

This table was prepared with information collected from unincorporated stores. However, there was the equivalent information for incorporated stores. Balance sheet information was presented also for rented and owned stores and, as above, for unincorporated and incorporated stores. Like the profit and loss data, the stores were broken down into a size distribution by sales.

Naturally, this man could compare the operating results taken from his own accounts with the average of those stores of his own size and type. This sort of information is available for several areas of retail trade, both for independent and chain stores. Similar and other useful data are published for the wholesale and service trades.

There is a good deal of census data that is useful for nearly any type of retail operation. Here's a sample of what's available:

1. population by counties, cities, specified age groups, specified origins, religious denomination, mother tongue, family size, etc.

2. number of retail establishments of different types (e.g. drug stores, shoe stores) in each city and town in Canada, and the value of sales for each group, payrolls, and inventories

3. earnings and weeks of employment of wage-earners by sex for cities and towns

4. credit statistics, showing cash and credit sales and accounts receivable at year end, by kind of business.

A catalogue which includes census publications is available from DBS. It contains descriptions of close to 1,000 different reports.

In this chapter we have tried to give you an idea of the range and depth of industry statistics. You've heard the old saying "Knowledge is Power". This statement referred originally to politics, but it applies equally well to your business.

helping hands

foreign trade data

More than one Canadian manufacturer has decided to produce a new product because he found a demand for it through import statistics. Similarly, many manufacturers and trading firms have found new markets from studying export statistics.

There are 12 comprehensive publications from DBS on foreign trade statistics, five of them monthly. The four most popular publications are:

1. **Imports by Commodities (monthly)**
2. **Imports by Countries (quarterly)**
3. **Exports by Commodities (monthly)**
4. **Exports by Countries (quarterly)**

There are working documents available for both import and export commodity classifications. These manuals list the commodities alphabetically, show the unit size (lb., cwt., ft., etc.) and give the number assigned to that commodity. These publications are indispensable for anyone studying import-export data.

The import-export information is often in surprising detail, and not confined to major or large commodities. Here is an example of import data:

Commodity and country	December 1964		January to December 1964	
	Quantity	Value	Quantity	Value
	dozen	$	dozen	$
Hack saw blades:				
United Kingdom	17,606	31,507	84,965	147,629
West Germany	456	843	5,774	4,307
Italy	150	1,084	300	2,173
Sweden	4,328	7,528	21,785	27,143
Poland	—	—	4,764	603
Japan	240	567	2,840	1,372
United States	376	1,673	20,359	32,561
Totals	**23,156**	**43,202**	**140,787**	**215,788**

The "value" of goods imported is usually the value as determined for customs duty. The Canadian Customs Act generally requires the valuation of goods f.o.b. point of shipment in the country of export.

For exported goods the values are defined as "the actual amount received or to be received in terms of Canadian dollars, exclusive of all charges" (freight, insurance, handling, etc).

A third popular use of foreign trade statistics is in estimating the domestic disappearance or consumption of a product. To do this you start with domestic production, add imports, then subtract exports.

labour facts

There are numerous publications from DBS that relate to the activities, composition, supply, location and earnings of the labour force. The varied content of labour statistics suggest many uses. Here are three.

1. For Market Research:

— estimates of labour income by province.

— indexes of employment and payrolls by province, by industry, and by urban centres.

2. For Industrial Relations and Collective Bargaining:

— average hourly earnings, average weekly hours and average weekly wages of hourly paid workers, by industry, by province and by selected localities.

— average weekly wages and salaries for salaried workers by industry, province, and selected localities.

— average weekly earnings and average weekly hours separately for men and women, production and salaried (clerical and other) in sub-divisions of manufacturing for provinces and selected localities.

— labour turnover rates by industry and province.

3. For Labour Cost Estimates:

— average hourly earnings and average weekly earnings of hourly paid workers by industry, province, and selected locality.

As you can see, the labour information is comprehensive. And the reports are quite current. Here is a sample from the monthly publication "Man-Hours and Hourly Earnings".

	Average weekly hours			Average hourly earnings		
	March 1965	Feb. 1965	March 1964	March 1965	Feb. 1965	March 1964
	number			dollars		
Winnipeg:						
Manufacturing	40.1	40.1	40.0	1.87	1.86	1.83
Food and Beverages	38.9	39.0	39.7	2.08	2.07	2.06
Meat Products	40.0	39.7	39.8	2.34	2.32	2.26
Clothing (textile and fur)	39.2	39.7	38.5	1.27	1.25	1.24
Transportation equipment	40.7	40.5	40.6	2.21	2.21	2.09
Building and general engineering[1]	37.8	37.7	34.8	2.32	2.32	2.25
Service[2]	34.2	34.6	34.7	1.19	1.20	1.13

	Average weekly wages			Wage-earners reported March 1965
	March 1965	Feb. 1965	March 1964	
	dollars			number
Winnipeg:				
Manufacturing	75.18	74.82	72.94	26,135
Food and Beverages	80.97	80.70	81.76	4,616
Meat Products	93.79	92.18	90.15	1,833
Clothing (textile and fur)	49.79	49.82	47.60	4,733
Transportation equipment	89.89	89.61	84.87	6,182
Building and general engineering[1]	87.75	87.53	78.21	3,473
Service[2]	40.82	41.53	39.28	5,886

[1] Building includes buildings and structures, special trade contractors. General engineering includes other construction, other than highways, bridges and streets.
[2] Hotels and restaurants, laundries, dyeing, cleaning and pressing plants, etc.

prices

For many years the movement and reporting of prices has received close attention by government and business alike. "Prices and Price Indexes", a monthly DBS publication, contains price information on many commodities and groups of commodities. There is also price data on services, building materials, and securities. Probably the most familiar of these indexes is the "Consumer Price Index". However, equally important price information relating to industry and agriculture is contained in the report.

The several publications on price data suggest many uses. Here are a few uses made of price information that are specified in relation to the principal group of price statistics.

A. Urban Retail Prices

1. negotiation and escalation of wages

2. escalation of such "contracts" as pension plans and welfare allowances

3. assessing the impact of changes in retail prices as an indicator of inflationary or deflationary conditions

B. Wholesale Prices

1. estimation of replacement cost and present value of capital assets — for depreciation rates and insurance coverage

2. cost and income analysis — in assessing the effects of price movements of inputs and outputs on the efficiency of the operation

3. in budget forecasts — to value future quantity estimates of supplies required

4. escalation in contracts to supply commodities.

Since the consumer price index is so widely talked about we will use it for an illustration. Here is how it appeared in a recent monthly publication called "Price Movements". (We have added to the table values for the year 1955).

Consumer Price Indexes (1949 = 100)

	Component weights[1]	1955	1964	1965		
			June	April	May	June
All items	**100**	**116. 4**	**135. 3**	**137. 7**	**138. 0**	**139. 0**
Food	27	112. 1	132. 5	133. 4	134. 5	137. 6
Housing[2]	32	122. 4	138. 4	140. 3	140. 5	140. 6
Clothing	11	108. 0	119. 0	121. 2	121. 0	121. 1
Transportation	12	118. 5	142. 0	145. 9	146. 8	147. 0
Health and personal care	7	126. 7	167. 3	175. 0	175. 6	175. 4
Recreation and reading	5	122. 6	151. 4	153. 5	154. 6	155. 0
Tobacco and alcohol	6	107. 4	120. 2	121. 9	122. 5	122. 5

[1] Component weights indicate the relative importance of item groups. (That is, the "typical" family would devote about 27% of their consumer expenditure to food items).
[2] This index is composed of shelter and household operation.

(See the Appendix, for an explanation of index numbers and further illustration).

what's going on?

Hardly a day goes by in the life of a businessman that someone doesn't ask him "how's business?" or, "how are things going?". And, as a businessman you make every attempt to keep informed on what is going on that may affect your operation. And we saw in the Veneer-Plywood case that you can learn a lot about what's going on in your industry from DBS statistics.

Similarly, there is a lot of information from DBS that indicates what's going on in the whole economy. These are the series and reports that government and business use to "feel the pulse of the nation", and to assess business conditions. They are often referred to as economic and/or business indicators.

The Canadian Statistical Review is a monthly publication that contains up-to-date figures on more than 100 activities. They include indexes on employment, prices, and industrial production. Included also is quantitative information on labour income, inventories, building permits, consumer credit and commercial failures. Many of these series are adjusted for seasonal variation. We will explain this in the appendix.

Also in the Canadian Statistical Review are data on the National Accounts. They contain such information as:

— **government revenue and expenditure**

— **gross national expenditure**

— **source and disposition of personal income**

— **national income and gross national product.**

These overall accounts are prominent as guides to rates and direction of economic activity, and to the functioning of the national economy. The national accounts are what might be called a set of books for different sectors of the economy, somewhat like the books which businessmen keep.

Also, to indicate "what's going on" a forecast, called "Private & Public Investment In Canada", is available each year on what individual industries have said they intend to do in the way of capital expansion and the purchase of new machinery. This report, obviously, has both competitive and marketing significance.

To sum up, we would like to call your attention to a quotation taken from the recent Glassco Commission Report which stresses the importance of information to business.

"To maintain a prosperous enterprise in a complex and dynamic economy, it has become necessary to base business decisions on a very broad knowledge of demand, supply and cost conditions. This knowledge must be wider and more varied than may be acquired by personal observation and experience alone. Much of the information required for managing a business comes, of course, from its own books, but even the most elaborate internal accounts cannot reflect important external data such as the percentage of the market captured; the location, age, sex and economic status of potential customers; industry trends in profits, marketing and labour costs, productivity, and capital investment; trends in long and short-term financing costs; and potential concentrations of raw materials and semi-finished components. Business planners must have this information if plans and objects are to be based on anything more than wishful thinking and guesswork".

helpful hints

There is a myriad of statistical information bombarding the public each day via the press, radio, TV and magazines. However, much of it has been summarized and adapted for news purposes, and can be misleading or inconclusive for business uses. It is easy to form a wrong opinion when statistics are incomplete, or, if the reader assumes too much or accepts them at face value.

Here are two examples of what we mean. A certain city once claimed to be "the healthiest in the nation" because it had the lowest death rate. What was not mentioned was the fact that the city had no major hospital and most serious cases were hospitalized in neighbouring cities. Deaths were recorded where death actually occurred.

Here is a second misleading and incorrect statement, "there are more car accidents in the daytime than at night therefore it is safer to drive at night."

DBS tries to discourage the misuse of statistics, and every attempt is made to avoid making the statistics misleading. For these reasons all reports contain definitions, footnotes and explanations. If the interpretive information is not contained in the report it is readily available on request.

It is to your advantage to follow these rules when you study a statistical report:

— **always read the introduction**

— **always read the headnotes and footnotes**

— **always read the definitions and explanatory notes**

— **if you're still not sure about something find out about it before using the statistics.**

In short, you have to go "behind" the statistics to find out what they indicate and what their limitations are. At their best, most statistics are approximations and a little out of date. The margin of error, however, is usually negligible for practical purposes.

Always be a little wary of simple "averages". Don't forget that the value contains the two extremes — the smallest and the largest. In the Joe Keene case we noted that the 3 Welland photographers had an "average income" of $14,100 in 1961. It **could** have been made up something like this —

photographer 1	$ 5,800
photographer 2	8,200
photographer 3	28,300
Total	42,300
Average	14,100

(In this hypothetical example two photographers make much less than the average)

This is why, in the Veneer-Plywood case, statistics were given for different sized groups. It makes the values more meaningful.

When you study a "time series" (see appendix) you may be inclined to forecast or predict something because you see a trend developing. When we do this we simply express the feeling that what has happened in the past will, to a greater or lesser extent, continue to happen in the future. Or, if there is a seasonal effect, that the effect will repeat itself. But you must remember that any projection of past experience into the uncertain future involves risk. It is done, however, by business and government all the time because planning for the future is necessary, and an imperfect plan is usually better than none at all. The best plan of course, is one which is flexible enough to allow for changing conditions as they appear, and in which assumptions about future events are supported, as much as possible, by past experience.

Finally, we emphasize again four important points:

1. **statistics are only one of many tools you can use to help you run your business**

2. **don't limit your source of information to DBS — use trade associations, chambers of commerce, boards of trade and other groups organized to help the businessman, other government departments, and the reference section of public libraries**

3. **often DBS has information you can use that is not published, or that can be compiled for you at cost**

4. **don't get in over your head — you may require the services of trained and experienced people to research your markets, products, etc.**

DBS is ready to serve you through regional offices located in eight cities across Canada. These offices have copies of all current DBS publications for you to consult. You can order copies through these offices (listed below) or through the stores of the Queen's Printer listed on page 37. Or, if it is more convenient, contact one of the DBS divisions in Ottawa. (see list on page 36).

In the appendix, we have discussed some of the ways statistics are presented and touched on some of the theory. You may want to refer again to the appendix when you study the information you receive.

Why not drop us a line, visit, or phone us today?

DBS regional offices

	Area Code	Telephone numbers
Regional Officer, Dominion Bureau of Statistics, Sir Humphrey Gilbert Building, Duckworth Street **ST. JOHN'S**, Nfld.	709	578 - 3145
Regional Officer, Dominion Bureau of Statistics, 1557 Hollis Street, **HALIFAX**, N.S.	902	423 - 7387
Regional Officer, Dominion Bureau of Statistics, 1165 Bleury Street, Suite 830, **MONTREAL** 1, P.Q.	514	875 - 2050
Regional Officer, Dominion Bureau of Statistics, 868 Merivale Road, **OTTAWA** 3, Ontario.	613	992 - 0256
Regional Officer, Dominion Bureau of Statistics, 36 Adelaide Street East, **TORONTO** 1, Ontario.	416	362 - 6211 Loc. 2433
Regional Officer, Dominion Bureau of Statistics, 269 Main Street, **WINNIPEG** 1, Manitoba.	204	943 - 4528

Regional Officer,	403	424-0251
Dominion Bureau of Statistics,		Loc. 259
Federal Public Building,		
107th Street,		
EDMONTON, Alberta.		
Regional Officer,	604	681-5288
Dominion Bureau of Statistics,		
326 Howe Street,		
VANCOUVER 1, B.C.		

Dominion Bureau
of Statistics,
Ottawa, Ontario

DIVISIONS	Area Code 613
Agriculture	
Farm Income and Expenditure, Crops, Livestock and Animal Products	992-4774
Business Finance	
Profits, Assets and Investment; Construction and Housing; Capital Expenditure; Scientific Research Expenditure	992-3348
Census	
Population, Housing and Families, Occupations and Employment, Agriculture	994-9463
Education	
Elementary and Secondary, University, Adult, Vocational, Education Finances	992-5933
External Trade	
Imports, Exports, and Balance of Trade	992-8896
Health and Welfare	
Instititions, Judicial, Public Health, Vital Statistics	992-6651
Industry	
Fisheries, Forestry, Foods and Beverages, Textiles, Minerals and Metal and Chemical Products, Productivity, Shipments, Inventories and Orders	992-4203

Labour
  Employment, Unemployment and Pensions .... 992 - 4467

Merchandising and Services
  Retail and Wholesale Trade, Census Surveys ...... 992 - 8574

National Accounts and Balance of Payments
  Balance of Payments, National Expenditure,
  National Product, Current Business Indicators,
  Industrial Output, Travel .... 992 - 8340

Prices
  Retail, Wholesale, Farm, International, Consumer
  Expenditures .... 992 - 3913

Public Finance and Transportation
  Government Finance, Government Employment
  and Payrolls, Transportation, Public Utilities .... 992 - 5396

Special Surveys
  Labour Force, Household Facilities .... 992 - 6782

Information
  Other (General) Inquiries .... 992 - 2959

Queen's Printer's
Book Stores

	Area Code	Telephone numbers
MONTREAL Aeterna-Vie Building, 1182 St. Catherine St. West.	514	861 - 6072
OTTAWA Daly Building, Corner of Mackenzie and Rideau.	613	992 - 6208
TORONTO Mackenzie Building 36 Adelaide St. East.	416	362 - 6211 Ex. 2498
WINNIPEG 499 Portage Ave., Mall Centre.	204	774 - 5461
VANCOUVER 657 Granville St.	604	681 - 7291

Beginning on the next page is a list of more popular DBS publications with a brief explanation of their content. It is difficult to categorize the actual publications by interest area because of the broad information a single document may contain. The best starting point is to scan the catalogue to find out how many publications are relevent to your problem or question. Here are a few suggestions, of the kind of information you can get by interest area:

1. What is your Consumer Like?

— how many are there and where do they live?
— how much money do they earn and how much credit exists?
— what is their age distribution, their nationalities, their education levels?

2. What is the Labour Situation?

— what is the composition of the labour force?
— where are the workers located?
— how much money are they earning?
— what is the unemployment level?

3. How is the Distribution System made up?

— how many retail establishments are there?
— what kind of stores make up the total?
— where are they and what are their sales?
— how many wholesalers are there and what are their sales?
— what is the size distribution of the retail and wholesale establishments?
— how many independent stores versus how many chain stores are there?

4. What is the Service Industry Like?

— how many services are there?
— where are they located and what are their sales?
— how many people employed?

5. How are your Competitors Doing?

— what is the sales growth?
— how much do they pay for materials, fuel, labour?
— what is the average profit level?
— how much is spent for new equipment?
— how many competitors have you got?

6. How Are Prices Behaving and Can You Look for New Market or New Product Opportunities?

— what are consumer prices doing?
— what are industry and wholesale prices doing?
— are factory shipments of finished products increasing?
— should you consider handling a fast growing item?
— are we exporting a lot of what you make?
— are we importing a lot of what you could make?

samples of DBS

publications

Available from: Publications Distribution,
Dominion Bureau of Statistics,
Ottawa, Ontario.

1. Catalogue of DBS Publications
— Contains complete list of titles and prices of all publications, a brief explanation of contents, and a subject index.

2. Daily and Weekly Bulletins ($1.00 a year)
— lists and summarizes information published by the day or week respectively for those who want to keep in touch with statistics as they are released.

3. Canadian Statistical Review (50¢ a copy, $5.00 a year)
— a monthly publication of current statistics in the areas of trade, manufacturing, finance, labour, prices, and transportation.

4. Canada Year Book (paper-bound $3.00, cloth-bound $5.00)
— the official statistical annual of Canada's history, social and economic conditions, resources, physiography, institutions, etc. Contains over 1200 pages.

5. Census
— publications of the 1961 Census, which include statistics on **population, agriculture, housing, income,** and **merchandising** and **services** are listed in the DBS Catalogue of publications. There are about 275 individual reports in the 1961 Census series. DBS is also able to provide certain information from the 1961 Census which is too detailed or specialized for general publication purposes. An example of this is the count of population and households for individual enumeration areas.

6. There are hundreds of reports, quarterly, annual, monthly and occasional, that provide valuable information on the following areas of activity:
— merchandising and services
— construction and housing
— prices
— business conditions
— farm income, values and general production
— farm crops, livestock and animal products
— fishing

- forestry
- mining
- foods, beverages and tobacco
- leather and rubber products
- textiles and apparel
- wood products
- paper products and printing
- metals
- machinery and transportation equipment
- electrical equipment
- non-metallic mineral products
- petroleum and coal products
- chemicals
- general surveys of inventories, shipments and orders in various manufacturing industries
- transportation; air, road, water and pipeline
- communications
- utilities
- external trade
- labour force and unemployment
- international travel
- government finance
- balance of payments and international investments
- public health
- hospitals
- education
- vital and judicial statistics

— write for a catalogue —

appendix

time series

Although our concern is with the future we have to begin by look-
ing backward. As a well known historian once said "A nation
ignorant of its history is destined to repeat it" — so with the
businessman. Thus we deal with statistical data which are col-
lected and usually recorded at regular intervals of time and which
are called "time series". We can abbreviate the term by referring
to such data simply as a "series". We speak of a series of
monthly farm prices, a series of monthly shipments of cement, a
series of numbers employed, and so on. Here is an example of a
series:

Department Store Sales, Canada, 1964

	millions of dollars
January	108.0
February	115.6
March	125.9
April	142.5
May	141.5
June	136.8
July	122.2
August	136.7
September	157.0
October	163.7
November	206.4
December	245.3

However, many series are not presented in absolute values
as above. That is, they do not express the values in dollars,
pounds, or feet. These series are expressed as index numbers.

index numbers

As suggested by the name, index numbers indicate some-
thing; usually how much things have changed or how they compare
with one another through time. Some point in time, called the base
period, is selected to equal 100 and all other numbers in the
series show percentage change from that base period.

For an example we will reproduce a portion of the table for the "Consumer Price Index" on page 30.

Consumer Price Index (1949 = 100)			
	1955	June 1964	June 1965
Food	112.1	132.5	137.6

Right away we note the base period is 1949 and all the price indexes are based on that year. These numbers mean that in June, 1965 retail food prices, on average, were 37.6% higher than they were in 1949. In other words, a typical Canadian had to spend about $1.38 to buy the same food that he could have bought for $1.00 in 1949. Similarly, in 1955, average retail food prices were 112% of the prices in 1949, or 12% higher.

Index numbers don't always measure changes in prices. Some measure changes in quantity like the "Index of Industrial Production". This index measures changes in the output of the nation's factories, mines, and electric and gas utilities. A good deal of statistical data is presented as index numbers.

Many time series, both in absolute values and as index numbers, can be shown in two ways. Firstly, the series are shown as unadjusted or original figures, and secondly, the series may be shown as adjusted for seasonal variation. This brings us to our final point — seasonal adjustment.

seasonal adjustment

In Canada, changing climatic conditions have a profound effect on nearly all our business activity. It is hard to think of a business operation that is not somehow connected to the seasons of the year. There are many demand and supply situations that come readily to mind, such as the drop in construction activity as winter approaches; the high demand for winter clothing at the same time; or the relatively big supply of fresh fruit and vegetables in mid-summer. In addition, the two months before Christmas can account for more than 1/3 of the annual sales of a jewellery store. And so on.

Seasonal variation, then, consists of patterns of demand and supply for a product or service which repeat themselves every year in a time series. In a monthly series, we can calculate twelve numbers called seasonal factors — one for each month. These "factors" are used to adjust the actual sales for seasonal

effects. For example, if the seasonal factor for a jewellery store's March sales is 84, this means typical March sales for the past several years have been about 84% of those of the **average** month. The average month's sales, of course, would be the annual sales divided by twelve. If the December factor is 140 then December sales are typically 140% of the average months' sales.

DBS has constructed seasonal factors for many different business series. Some of these series are on employment, retail sales, consumer credit, and inventories in manufacturing. Once we have seasonal factors we can estimate what the sales or employment etc. **would have been** had there been no seasonal variation. That is, we are able to take out the effect of seasonal variation in the series.

Let's imagine you plot the monthly sales of a retail store on graph paper. With the store's sales affected by seasonal variation you would have a highly irregular sales curve. The seasonally slow months, like March above, would be unusually low on the curve and the seasonally active months, like December, would be unusually high values on the curve. When we adjust the sales for seasonal variation we simply flatten the peaks of the unusually high months and lift up the unusually low months. This correction tends to "straighten out" the curve and allows us a better view of the overall trend of the curve. The result shows approximately the sales performance as if it had not been affected by seasonal variation.

For an example of seasonal adjustment we will use "Department Store Sales, Canada, 1964".

Month	Unadjusted or actual sales (1)	Monthly factor (2)	Seasonally adjusted sales (1 ÷ 2)
	millions of dollars		millions of dollars
January	108.0	.738	146.4
February	115.6	.786	147.0
March	125.9	.874	144.1
April	142.5	.967	144.7
May	141.5	.956	147.9
June	136.8	.932	146.7
July	122.2	.800	152.8
August	136.7	.909	150.4
September	157.0	1.05	149.4
October	163.7	1.04	158.2
November	206.4	1.32	156.4
December	245.3	1.63	150.3

Here, under "actual sales", we can see the low months like February (sales $115.6 million) and the high months like December (sales $245.3 million) are vastly different in size. Under "seasonally adjusted sales" the difference is considerably less ($146.4 vs. $150.3). This is the result of taking out the effects of low and high seasonal demand. This adjusted series allows us to study our sales growth without being led astray by the seasonal effects.

The construction of the seasonal factors (actually called seasonal index numbers) can be a laborious and complex job. We will not discuss the subject here. But when you are using statistics, it is important to know about seasonal adjustment and why it is done.

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